Patent Claims

1. A scanning microscope for imaging an object (1), comprising a light source (2), a spectrally selective element (8) that can be adjusted in an almost infinitely variable manner, a spectrally selective detection device (4) that can be adjusted in an almost infinitely variable manner, an illumination beam path (3) extending from the light source (2) to the object (1), a detection beam path (5) extending from the object (1) to the detection device (4), whereby the spectrally selective element (8) can be used to select light from the light source (2) in order to illuminate the object, whereby the selected light from the light source (2) that is reflected and/or scattered on the object (1) can be masked out of the detection beam path (5) by means of the spectrally selective element (8), whereby at least one wavelength range of the light extending along the detection beam path (5) can be detected by means of the spectrally selective detection device (4),
characterized in that the illumination beam path (3) and the detection beam path (5) are configured in the form of a confocal slit scanner.

2. The scanning microscope according to Claim 1, characterized in that an illumination slit diaphragm (11) is provided in the illumination beam path (3).

3. The scanning microscope according to Claim 1 or 2, characterized in that a detection slit diaphragm (13) is provided in the detection beam path (5).

4. The scanning microscope according to Claim 2 or 3, characterized in that the slit length and/or the slit width of the illumination slit diaphragm (11) and/or of the detection slit diaphragm (13) can be variably set.

5. The scanning microscope according to Claim 4, characterized in that the illumination slit diaphragm (11) and/or the detection slit diaphragm (13) comprise diaphragms (16, 17, 18, 19) that are arranged moveably, whereby preferably one

side of each diaphragm (16, 17, 18, 19) forms the slit of the illumination slit diaphragm (11) or the detection slit diaphragm (13).

6. The scanning microscope according to Claim 4 or 5, characterized in that the illumination slit diaphragm (11) and/or the detection slit diaphragm (13) are each associated with a variable-focus optical system (22) by means of which the effective slit length and/or the effective slit width of the illumination slit diaphragm (11) or of the detection slit diaphragm (13) can be varied.

7. The scanning microscope according to one of Claims 1 to 6, whereby the spectrally selective element (8) comprises an active optical component that can be actuated, preferably an acousto-optical-tunable filter (AOTF) or an acousto-optical deflector (AOD).

8. The scanning microscope according to one of Claims 1 to 7, characterized in that the spectrally selective detection device (4) has means (23) – preferably in the form of a prism – to spectrally split the light extending along the detection beam path (5), means (24, 40) to select a first spectral region (25) for detection by means of a first detector (6), and means (24, 40) to reflect at least part of the spectral region that has not been selected for purposes of detection with a second detector (7).

9. The scanning microscope according to one of Claims 1 to 8, characterized in that the detection device (4) has a flat or a linear detector (6, 7, 32, 34) that has a spatial resolution corresponding to its flat or linear shape.

10. The scanning microscope according to Claim 9, characterized in that the detector (6, 7, 32, 34) comprises a CCD element that is configured in the form of a CCD array or a CCD line.

11. The scanning microscope according to Claim 10, characterized in that a – preferably variable – adaptation optical system is arranged in the detection beam path (5) in front of a detector (6, 7, 32, 34) of the detection device (4), by means of which adaptation optical system the spectral region to be detected can be adapted to the detector shape.

12. The scanning microscope according to Claim 10 or 11, characterized in that a means (33) for recombining the light is positioned in the detection beam path (5) in front of a detector (32, 34) of the detection device (4), said means generating an essentially linear or focused light beam.

13. The scanning microscope according to Claim 12, characterized in that the means (33) for recombining the light comprises a lens, a prism, an optical diffraction grating or a hologram.

14. The scanning microscope according to one of Claims 1 to 13, characterized in that the detector (6, 7, 32, 34) of the detection device (4) has a read-out rate in the µs or ns range, so that preferably fluorescent lifetime experiments and/or the decay behavior of luminescence specimens can be time-resolved.

15. The scanning microscope according to Claim 14, characterized in that the detector (6, 7, 32, 34) of the detection device (4) has an activation unit that allows a time-related activation and deactivation of the detector.

16. The scanning microscope according to one of Claims 1 to 15, characterized by a multi-photon excitation of the object (1) or of a marker that serves to mark the object.